

What is claimed is:

1. A component-embedded board fabrication method for fabricating a component-embedded board with electronic components embedded within a wiring board,  
5 comprising:

a first detection step for detecting, before said board is covered with a first insulating layer, the actual position of a first electronic component formed on a surface of said board;

10 a first holding step for calculating a displacement between the design position of said first electronic component and the actual position of said first electronic component on the surface of said board, and for holding said displacement as first displacement  
15 data; and

a first correction step for correcting, based on said first displacement data, design data to be used for processing said board after said board is covered with said first insulating layer.

20 2. A component-embedded board fabrication method as claimed in claim 1, further comprising a first maskless exposure step for applying, based on said design data corrected in said first correction step, a maskless exposure to said board covered with said first insulating  
25 layer.

3. A component-embedded board fabrication method as claimed in claim 1, further comprising a first direct patterning step for forming, based on said design data corrected in said first correction step, a wiring pattern  
30 by inkjetting on said board covered with said first insulating layer.

4. A component-embedded board fabrication method as claimed in claim 1, further comprising a first via formation step for forming, based on said design data  
35 corrected in said first correction step, a via hole in said board covered with said first insulating layer.

5. A component-embedded board fabrication method

as claimed in claim 1, further comprising:

a second detection step for detecting,  
before said board is covered with a second insulating  
layer, the actual position of a second electronic  
5 component formed on a surface of said first insulating  
layer in which said first electronic component is already  
embedded;

a second holding step for calculating a  
displacement between the design position of said second  
10 electronic component and the actual position of said  
second electronic component on the surface of said first  
insulating layer, and for holding said displacement as  
second displacement data; and

a second correction step for correcting,  
15 based on said second displacement data, design data to be  
used for processing said board after said board is  
covered with said second insulating layer.

6. A component-embedded board fabrication method  
as claimed in claim 1, further comprising:

20 a first imaging step for capturing, before  
said board is covered with a second insulating layer, an  
image of a surface of said first insulating layer on  
which a second electronic component is formed and in  
which said first electronic component is already  
25 embedded;

a second holding step for calculating a  
displacement between the design position of said second  
electronic component and the actual position of said  
second electronic component detected from second image  
30 data obtained by imaging the surface of said first  
insulating layer, and for holding said displacement as  
second displacement data; and

a second correction step for correcting,  
based on said second displacement data, design data to be  
35 used for processing said board after said board is  
covered with said second insulating layer.

7. A component-embedded board fabrication method

as claimed in claim 5, further comprising a second maskless exposure step for applying, based on said design data corrected in said second correction step, a maskless exposure to said board covered with said second  
5 insulating layer.

8. A component-embedded board fabrication method as claimed in claim 6, further comprising a second maskless exposure step for applying, based on said design data corrected in said second correction step, a maskless  
10 exposure to said board covered with said second insulating layer.

9. A component-embedded board fabrication method as claimed in claim 5, further comprising a second direct patterning step for forming, based on said design data  
15 corrected in said second correction step, a wiring pattern by inkjetting on said board covered with said second insulating layer.

10. A component-embedded board fabrication method as claimed in claim 6, further comprising a second direct patterning step for forming, based on said design data  
20 corrected in said second correction step, a wiring pattern by inkjetting on said board covered with said second insulating layer.

11. A component-embedded board fabrication method as claimed in claim 5, further comprising a second via formation step for forming, based on said design data  
25 corrected in said second correction step, a via hole in said board covered with said second insulating layer.

12. A component-embedded board fabrication method as claimed in claim 6, further comprising a second via formation step for forming, based on said design data  
30 corrected in said second correction step, a via hole in said board covered with said second insulating layer.

13. A component-embedded board fabrication method as claimed in claim 1, wherein when the actual position  
35 of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in

said design data as being the end to be connected to the terminal of said electronic component, said first correction step corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

14. A component-embedded board fabrication method as claimed in claim 1, wherein when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said first correction step corrects said design data so as to move said wiring line away from the terminal of said other electronic component.

15. A component-embedded board fabrication method as claimed in claim 5, wherein when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said second correction step corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

16. A component-embedded board fabrication method as claimed in claim 5, wherein when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said second correction step corrects said design data so as to move said wiring line away from the terminal of said other electronic component.

17. A component-embedded board fabrication method as claimed in claim 6, wherein when the actual position of a terminal of said formed electronic component is

displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said second correction step corrects said design data so as to move  
5 said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

18. A component-embedded board fabrication method as claimed in claim 6, wherein when the actual position  
10 of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said second correction step corrects said design data so as to move  
15 said wiring line away from the terminal of said other electronic component.

19. A component-embedded board fabrication method for fabricating a component-embedded board with electronic components embedded within a wiring board,  
20 comprising:

a first imaging step for capturing, before said board is covered with a first insulating layer, an image of a surface of said board on which a first electronic component is formed;

25 a first holding step for calculating a displacement between the design position of said first electronic component and the actual position of said first electronic component detected from first image data obtained by imaging the surface of said board, and for  
30 holding said displacement as first displacement data; and

a first correction step for correcting, based on said first displacement data, design data to be used for processing said board after said board is covered with said first insulating layer.

35 20. A component-embedded board fabrication method as claimed in claim 19, further comprising a first maskless exposure step for applying, based on said design

data corrected in said first correction step, a maskless exposure to said board covered with said first insulating layer.

5           21. A component-embedded board fabrication method as claimed in claim 19, further comprising a first direct patterning step for forming, based on said design data corrected in said first correction step, a wiring pattern by inkjetting on said board covered with said first insulating layer.

10           22. A component-embedded board fabrication method as claimed in claim 19, further comprising a first via formation step for forming, based on said design data corrected in said first correction step, a via hole in said board covered with said first insulating layer.

15           23. A component-embedded board fabrication method as claimed in claim 19, further comprising:  
a first detection step for detecting,  
before said board is covered with a second insulating layer, the actual position of a second electronic  
20 component formed on a surface of said first insulating layer in which said first electronic component is already embedded;

a second holding step for calculating a displacement between the design position of said second  
25 electronic component and the actual position of said second electronic component on the surface of said first insulating layer, and for holding said displacement as second displacement data; and

a second correction step for correcting,  
30 based on said second displacement data, design data to be used for processing said board after said board is covered with said second insulating layer.

24. A component-embedded board fabrication method as claimed in claim 19, further comprising:

35           a second imaging step for capturing,  
before said board is covered with a second insulating layer, an image of a surface of said first insulating

layer on which a second electronic component is formed and in which said first electronic component is already embedded;

5                   a second holding step for calculating a displacement between the design position of said second electronic component and the actual position of said second electronic component detected from second image data obtained by imaging the surface of said first insulating layer, and for holding said displacement as  
10                   second displacement data; and

                  a second correction step for correcting, based on said second displacement data, design data to be used for processing said board after said board is covered with said second insulating layer.

15           25. A component-embedded board fabrication method as claimed in claim 23, further comprising a second maskless exposure step for applying, based on said design data corrected in said second correction step, a maskless exposure to said board covered with said second  
20           insulating layer.

                  26. A component-embedded board fabrication method as claimed in claim 24, further comprising a second maskless exposure step for applying, based on said design data corrected in said second correction step, a maskless  
25           exposure to said board covered with said second insulating layer.

                  27. A component-embedded board fabrication method as claimed in claim 23, further comprising a second direct patterning step for forming, based on said design  
30           data corrected in said second correction step, a wiring pattern by inkjetting on said board covered with said second insulating layer.

                  28. A component-embedded board fabrication method as claimed in claim 24, further comprising a second  
35           direct patterning step for forming, based on said design data corrected in said second correction step, a wiring pattern by inkjetting on said board covered with said

second insulating layer.

29. A component-embedded board fabrication method as claimed in claim 23, further comprising a second via formation step for forming, based on said design data  
5 corrected in said second correction step, a via hole in said board covered with said second insulating layer.

30. A component-embedded board fabrication method as claimed in claim 24, further comprising a second via formation step for forming, based on said design data  
10 corrected in said second correction step, a via hole in said board covered with said second insulating layer.

31. A component-embedded board fabrication method as claimed in claim 19, wherein when the actual position of a terminal of said formed electronic component is  
15 displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said first correction step corrects said design data so as to move said end of said wiring line to be connected to the  
20 terminal of said electronic component to the actual position of said formed electronic component.

32. A component-embedded board fabrication method as claimed in claim 19, wherein when the actual position of a terminal of said formed electronic component is  
25 displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said first correction step corrects said design data so as to move said wiring line away from the terminal of said other  
30 electronic component.

33. A component-embedded board fabrication method as claimed in claim 23 wherein, when the actual position of a terminal of said formed electronic component is  
35 displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said second correction step corrects said design data so as to move



said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

5        34. A component-embedded board fabrication method  
as claimed in claim 23 wherein, when the actual position  
of a terminal of said formed electronic component is  
displaced from the position specified by said design data  
and intersects with a wiring line used for connection to  
a terminal of another electronic component, said second  
10       correction step corrects said design data so as to move  
said wiring line away from the terminal of said other  
electronic component.

15       35. A component-embedded board fabrication method  
as claimed in claim 24 wherein, when the actual position  
of a terminal of said formed electronic component is  
displaced from an end of a wiring line that is defined in  
said design data as being the end to be connected to the  
terminal of said electronic component, said second  
correction step corrects said design data so as to move  
20       said end of said wiring line to be connected to the  
terminal of said electronic component to the actual  
position of said formed electronic component.

25       36. A component-embedded board fabrication method  
as claimed in claim 24 wherein, when the actual position  
of a terminal of said formed electronic component is  
displaced from the position specified by said design data  
and intersects with a wiring line used for connection to  
a terminal of another electronic component, said second  
correction step corrects said design data so as to move  
30       said wiring line away from the terminal of said other  
electronic component.

35       37. A component-embedded board fabrication  
apparatus for fabricating a component-embedded board with  
electronic components embedded within a wiring board,  
comprising:

             a detecting unit for detecting, before  
said board is covered with an insulating layer, the

actual position of an electronic component formed on a surface of said board;

a holding unit for calculating a displacement between the design position of said electronic component and the actual position of said electronic component on the surface of said board, and for holding said displacement as displacement data; and

a correcting unit for correcting, based on said displacement data, design data to be used for processing said board after said board is covered with said insulating layer.

38. A component-embedded board fabrication apparatus as claimed in claim 37, further comprising a maskless exposure unit for applying, based on said design data corrected by said correcting unit, a maskless exposure to said board covered with said insulating layer.

39. A component-embedded board fabrication apparatus as claimed in claim 37, further comprising a direct patterning unit for forming, based on said design data corrected by said correcting unit, a wiring pattern by inkjetting on said board covered with said insulating layer.

40. A component-embedded board fabrication apparatus as claimed in claim 37, further comprising via forming unit for forming, based on said design data corrected by said correcting unit, a via hole in said board covered with said insulating layer.

41. A component-embedded board fabrication apparatus as claimed in claim 37, wherein when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component, said correcting unit corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual

position of said formed electronic component.

42. A component-embedded board fabrication apparatus as claimed in claim 37 wherein, when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic component, said correcting unit corrects said design data so as to move said wiring line away from the terminal of said other electronic component.

43. A component-embedded board fabrication apparatus for fabricating a component-embedded board with electronic components embedded within a wiring board, comprising:

an imaging unit for capturing, before said board is covered with an insulating layer, an image of a surface of said board on which an electronic component is formed;

a holding unit for calculating a displacement between the design position of said electronic component and the actual position of said electronic component detected from image data obtained by imaging the surface of said board, and for holding said displacement as displacement data; and

a correcting unit for correcting, based on said displacement data, design data to be used for processing said board after said board is covered with said insulating layer.

44. A component-embedded board fabrication apparatus as claimed in claim 43, further comprising a maskless exposure unit for applying, based on said design data corrected by said correcting unit, a maskless exposure to said board covered with said insulating layer.

45. A component-embedded board fabrication apparatus as claimed in claim 43, further comprising a direct patterning unit for forming, based on said design

data corrected by said correcting unit, a wiring pattern by inkjetting on said board covered with said insulating layer.

5        46. A component-embedded board fabrication apparatus as claimed in claim 43, further comprising a via forming unit for forming, based on said design data corrected by said correcting unit, a via hole in said board covered with said insulating layer.

10       47. A component-embedded board fabrication apparatus as claimed in claim 43 wherein, when the actual position of a terminal of said formed electronic component is displaced from an end of a wiring line that is defined in said design data as being the end to be connected to the terminal of said electronic component,  
15       said correcting unit corrects said design data so as to move said end of said wiring line to be connected to the terminal of said electronic component to the actual position of said formed electronic component.

20       48. A component-embedded board fabrication apparatus as claimed in claim 43 wherein, when the actual position of a terminal of said formed electronic component is displaced from the position specified by said design data and intersects with a wiring line used for connection to a terminal of another electronic  
25       component, said correcting unit corrects said design data so as to move said wiring line away from the terminal of said other electronic component.